

$$v_1 = \sqrt{2} \cdot 415 \cos(100\pi t) \text{ V}$$

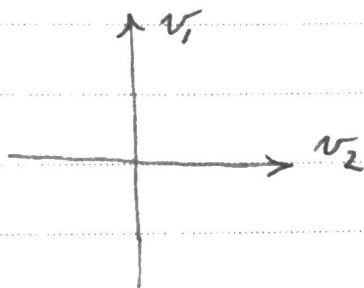
$$v_2 = \sqrt{2} \cdot 415 \sin(100\pi t) \text{ V}$$

$$f = 50 \text{ Hz}$$

$$RMS = 415 \text{ V}$$

$$v_1 = 415 \text{ V} \angle 90^\circ \rightarrow \boxed{\text{H}}$$

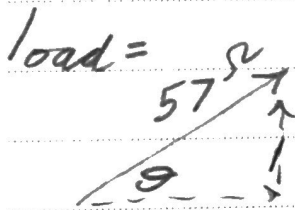
$$v_2 = 415 \text{ V} \angle 0^\circ \rightarrow \boxed{\text{I}}$$



$$KVL_1 \rightarrow v_1 - (i_1)(j4) - (i_1 + i_2)(\boxed{\text{B}}) = 0$$

$$v_1 - (i_1)(j4) - (i_1)(\boxed{\text{B}}) - i_2(\boxed{\text{B}}) = 0$$

$$v_1 - (i_1)(j4 + \boxed{\text{B}}) - i_2(\boxed{\text{B}}) = 0$$



$$\cos^{-1}.7 = 45.6^\circ$$

$$57 \angle 45.6^\circ \rightarrow \boxed{\text{B}}$$

$$KVL_2 \rightarrow v_2 - (i_2)(j6) - (i_1 + i_2)(\boxed{\text{B}}) = 0$$

$$v_2 - (i_2)(j6) - (i_1)(\boxed{\text{B}}) - i_2(\boxed{\text{B}}) = 0$$

$$v_2 - (i_2)(j6 + \boxed{\text{B}}) - (i_1)(\boxed{\text{B}}) = 0$$

Need to get rid of a variable.

$$(i_1)(j4 + \boxed{\text{B}}) + (i_2)(\boxed{\text{B}}) = \boxed{\text{H}}$$

$$(i_1)(\boxed{\text{B}}) + (i_2)(j6 + \boxed{\text{B}}) = \boxed{\text{I}}$$

$$\begin{pmatrix} -\boxed{\text{B}} \\ \boxed{\text{N}} \end{pmatrix} \begin{pmatrix} i_1 \boxed{\text{M}} \\ i_1 \boxed{\text{B}} \end{pmatrix} + \begin{pmatrix} i_2 \boxed{\text{B}} \\ i_2 \boxed{\text{N}} \end{pmatrix} = \begin{pmatrix} \boxed{\text{H}} \\ \boxed{\text{I}} \end{pmatrix} \begin{pmatrix} -\boxed{\text{B}} \\ \boxed{\text{N}} \end{pmatrix}$$

$$i_1 \boxed{\text{M}} + i_2 \boxed{\text{B}} = \boxed{\text{H}}$$

$$-i_1 \frac{\boxed{\text{B}}^2}{\boxed{\text{N}}} + i_2 \boxed{\text{N}} \left(-\frac{\boxed{\text{B}}}{\boxed{\text{N}}} \right) = \boxed{\text{I}} \left(-\frac{\boxed{\text{B}}}{\boxed{\text{N}}} \right)$$